Remarks

Thorough examination by the Examiner is noted and appreciated.

The claims have been amended to clarify Applicants invention and overcome Examiners objections and rejections.

Support for the new claims is found in the previously presented claims and the Figures.

No new matter has been added.

Claim Objections

The claims have been amended to overcome Examiners objections.

Claim Rejections under 35 USC 112

The claims have been amended to overcome Examiners rejections.

Claim Rejections under 35 USC 102

1. Claims 1 and 2 stand rejected under 35 USC Section 102(a) as being anticipated by Miura et al. (USPUB 2003/0155247).

Miura et al. disclose an electrolyte solution for plating copper to fill vias and trenches on silicon wafers (see Abstract). The electrolyte solution of Miura et al. overcomes the problem of **dissolving a seed layer by an acid bath** by providing the electrolyte solution at a pH of from 4 to 10 and by providing a complexing agent (see paragraph 0014). Among several other types of complexing agents, Miura et al. teach that **oxycarboxylic and organic phosphonic acids in the form of salts** may be used (paragraph 0023, 0027, and 0029). Miura et al. teach that the complexing agent **serves the purpose of adjusting the pH of the electroplating solution**. Miura et al. teach that **any type of wetting agent may be added** to the electroplating solution including nonionic surfactants, anionic surfactants, cationic surfactants and amphoteric surfactants (paragraph 0043). Miura et al. teach that the electroplating solution adds to the thickness of the seed layer (paragraph 0051) **by not dissolving it.**

Thus, Miura et al. fail to disclose several aspects of Applicants disclosed and claimed invention.

Nowhere do Miura et al. teach or suggest including those elements in **bold type:**

"An **electrolyte bath,** comprising:

an electrolyte solution suitable for metal electroplating; and

a composition comprising an organic acid and a non-ionic polymer mixed with said organic acid;

wherein said composition is disposed as a suspension layer within said electrolyte solution, said suspension layer of sufficient dimension to form a wetting layer on a substrate as said substrate is passed through said suspension layer."

Thus, Miura et al. is clearly insufficient to anticipate Applicants disclosed and claimed invention.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor*

Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Miura et al. does not teach a **non-ionic polymer**, but rather teaches complexing agents of **oxycarboxylic and organic phosphonic acids in the form of salts, and odes not disclose any particular wetting agent**. Miura et al. teach that **any type of wetting agent** may be used including **nonionic surfactants**, anionic surfactants, cationic surfactants and amphoteric surfactants.

Examiner is mistaken that Miura et al. teaches a non-ionic polymer or a non-ionic polymer mixed with an organic acid or a suspension layer within and electrolyte solution.

Examiner argues that since **Willis** teaches that non-ionic wetting may include non-ionic polymers (citing col 5, lines 39-col 8, lines 46), that this is sufficient (note that Willis discloses wetting agents such as non-ionic glycol derivatives such as polyalkylene glycol ethers and methoxy polyethylene glycol (col 6, lines 37-40). Examiner is erroneously attempting to combine Willis with Miura et al. in a 102(b) rejection. Also please note that Miura et al. do no disclose any non-ionic polymers in the examples (pages 4-5) showing the composition of the plating solution.

Miura et al. does not disclose "**wherein said composition is disposed as a suspension layer within said electrolyte solution, said suspension layer of sufficient dimension to form a wetting layer on a substrate as said substrate is passed through said suspension layer.**"

Examiner erroneously argues that since Miura et al. disclose the same composition, that it is either irrelevant or inherent that the composition would form a suspension layer in the electrolyte plating solution.

Applicants again reject Examiners argument that since Miura et al. teach that both an organic acid and a non-ionic surfactant may be used as complexing agents **and added to the electroplating solution to control the pH of the electroplating solution**, that it is **inherent that a suspension layer** is disposed within the electrolyte as Applicants have disclosed and claimed. Examiner has provided no support for this assertion, and Miura et al. nowhere disclose or teach a suspension layer within the electrolyte or that it is sufficiently dimensioned to form a wetting layer on a substrate as Applicants have claimed.

Examiner merely states **the bath** of Miura **has the same properties** as Applicants "because similar compositions can

reasonably be expected to yield products which inherently have the same properties". Examiner cites no support for this assertion, and nevertheless, it is clear that disposing a suspension composition within an electrolyte bath **is not a material or chemical property of a composition,** but depends on several factors including a complex interrelationship between the compositions of the electrolyte, the composition of the suspension and whether or not the bath is agitated.

"To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *In re Oelrich, 666 F.2d 578, 581-582, 212 USPQ 323, 326 (CCPA 1981).*

Examiner has not established that the wetting agents of Miura et al. (which may be any wetting agent) necessarily could be disposed as a suspension in and electrolyte bath, indeed, **Miura et al. does not disclose an electrolyte bath.**

"In relying on the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the

applied prior art." *Ex Parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990.*

Examiner has provided no legitimate technical reasoning that 'any wetting agent' including a 'non-ionic surfactant' added to the **electrolyte solution** of Miura et al. would necessarily result in Applicants invention including:

"**wherein said composition is disposed as a suspension layer within said electrolyte solution, said suspension layer of sufficient dimension to form a wetting layer on a substrate as said substrate is passed through said suspension layer.**"

2. Claims 9 and 10 stand rejected under 35 USC Section 102(a) as being anticipated by Miura et al. (USPUB 2003/0155247).

Applicants reiterate the comments made above with respect to Miura et al.

Applicants reiterate that nowhere do Miura et al. disclose an electrolyte bath as Applicants have disclosed and claimed.

Applicants also again reject Examiners assertion that the

disposition of a suspension layer in an electrolyte bath would be inherent in the electrolyte solution taught by Miura et al. Indeed, Miura et al. **nowhere disclose an electrolyte bath,** and merely disclose immersing small pieces of a silicon wafer with a seed layer in an electrolyte solution to determine the dissolution rate of the seed layer (paragraph 0074).

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

"To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *In re Oelrich, 666 F.2d 578, 581-582, 212 USPQ 323, 326 (CCPA 1981).*

"In relying on the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably

support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art." *Ex Parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)*

3. Claims 17 and 20 stand rejected under 35 USC Section 102(a) as being anticipated by Miura et al. (USPUB 2003/0155247).

Applicants reiterate the comments made above with respect to Miura et al.

Nowhere do Miura et al. teach or suggest including those elements in **bold type**:

"A method for electroplating a metal onto a surface in an electroplating electrolyte solution, comprising the steps of:

providing a composition mixture comprising an organic acid and a non-ionic polymer;

forming a suspension layer of said composition mixture within said electrolyte solution;

forming a wetting layer on said surface by passing said

surface through said suspension layer and into said electrolyte solution; and

electroplating said metal onto said surface following forming said wetting layer."

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

In response, Examiner recites references applicable to a determination of obviousness under no longer applicable law, and which cases are nowhere found in the MPEP: "there is no requirement that the missing descriptive matter be expressly articulated in one or more of the references. References are evaluated by what their collectively suggest to one versed in the art, rather than by their specific disclosures." Citing In re Simon 174 USPQ 114 (CCPA 1972) and In re Richman 165 USPQ 509, 514(CCPA 1970). These references are clearly not applicable cases law under an anticipation standard. The following cases are presented in the MPEP as the standard for anticipation:

"A claim is anticipated only **if each and every element** as set forth in the claim is found, either **expressly or inherently described**, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention **must be shown in as complete detail as is contained in the ... claim**." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

"To establish inherency, the extrinsic evidence must make clear that the **missing descriptive matter is necessarily present** in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *In re Oelrich, 666 F.2d 578,, 581-582, 212 USPQ 323, 326 (CCPA 1981).*

"In relying on the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic ***necessarily* flows from the teachings of the applied prior art.**" *Ex Parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)*

Claim Rejections under 35 USC 103

4. Claims 3-8 stand rejected under 35 USC Section 103(a) as being unpatentable over Miura et al., above, in view of Willis (US 4,347,108).

Applicants reiterate the above comments with respect to Miura et al.

Even assuming *arguendo*, a proper motivation for combining the teachings of Miura et al., and Willis, the further fact that Willis teaches **acidic copper electroplating baths** and that **one or more wetting agents may be incorporated into the plating bath** preferably dissolved in water (see paragraph 10, lines 3-24) including **polyoxyalkylated napthols** (col 5, lines 39-45), **nonionic agents including ether linkages** (col 6, lines 9-16), or that amines, alkanols amines, amides, and non-ionic polyglycol-type wetting agents, does not further help Examiner in producing Applicants invention or establishing a *prima facie* case of obviousness.

Applicants further note that disposition of a suspension layer as Applicants have disclosed and claimed would make the complexing agents of Miura et al. **unsuitable for the intended**

purpose of controlling the pH of the electroplating solution.

Even assuming *arguendo*, a proper motivation for combination, such combination fails to produce Applicants disclosed and claimed invention.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).*

Applicants again note that disposition of a suspension within an electrolyte bath is not solely dependent on material properties, and the cited reference nowhere disclose or suggest Applicants disclosed and claimed invention.

Examiners arguments directed toward claimed concentrations of Applicants suspension layer (composition), as being optimizable ranges obtainable by routine experimentation is misplaced since, Examiner has not shown several elements of Applicants invention, or any suggestion thereof, including Applicants suspension layer within an electrolyte bath, in the

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prior art.

5. Claims 11-16 stand rejected under 35 USC Section 103(a) as being unpatentable over Miura et al., above, in view of Willis (US 4,347,108).

Applicants reiterate the comments made above with respect to Miura et al. and Willis.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).*

Examiners arguments directed toward claimed concentrations of Applicants suspension layer (composition), as being optimizable ranges obtainable by routine experimentation is misplaced since, Examiner has not shown several elements of Applicants invention, or any suggestion thereof, including Applicants suspension layer within an electrolyte bath, in the prior art.

6. Claims 18 and 19 stand rejected under 35 USC Section 103(a) as being unpatentable over Miura et al., above, in view of Willis (US 4,347,108).

Applicants reiterate the comments made above with respect to Miura et al., and Willis.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).*

Conclusion

The cited references, singly or in combination fail to produce Applicants disclosed and claimed invention, and therefore fail to make out a *prima facie* case of anticipation or obviousness.

Applicants have amended their claims to further clarify Applicants disclosed and claimed invention and to overcome Examiners objections and rejections under Section 112. Applicants respectfully request reconsideration of their claims

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and submit that Applicants Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

In the event that the present invention as claimed is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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